

CLAIMS

1. A thermal flowmeter of a fluid, comprising:

a flow rate measuring element disposed in a fluid passage and including a heating resistor generating heat with supply of a current, a temperature compensation resistor for detecting a fluid temperature, a first temperature measuring resistor for measuring a temperature upstream of said heating resistor, and a second temperature measuring resistor for measuring a temperature downstream of said heating resistor, all of said resistors being formed on the same substrate;

a temperature control circuit for controlling a temperature of said heating resistor;

a casing supported to a wall surface of an intake pipe forming said fluid passage and supporting said flow rate measuring element;

a temperature sensor for measuring a temperature in said casing;

a computing unit for receiving signals corresponding to a fluid flow rate from said first and second temperature detecting resistors, performing correction depending on temperature by using said temperature sensor, and outputting the corrected result; and

heating temperature control means causing a difference between the fluid temperature and the temperature of said heating resistor to be changed depending on the fluid temperature.

2. The thermal flowmeter of the fluid according to Claim 1, wherein said heating temperature control means forms a bridge circuit in cooperation with said heating resistor, said temperature compensation resistor, said first resistor, and said second resistor, and said temperature compensation resistor differs in resistance temperature coefficient from said heating resistor, said first resistor, and said second resistor, thereby causing the heating temperature to be lowered as the air temperature rises.

3. The thermal flowmeter of the fluid according to Claim 1 or 2, wherein said heating resistor, said temperature compensation resistor, said first resistor, and said second resistor are all made of the same resistor material and form a bridge circuit, and a fixed resistor differing in resistance temperature coefficient from said resistor material is connected to said temperature compensation resistor in parallel.

4. A thermal flowmeter of a fluid, comprising:
a flow rate detecting element disposed in a fluid passage and including a heating resistor generating heat with supply of a current, and first and second temperature detecting resistors for measuring respective temperatures upstream and downstream of said heating resistor, all of said resistors being formed on the same substrate;
a temperature control circuit for controlling a

temperature of said heating resistor;

a flow rate detecting circuit for taking out signals corresponding to a fluid flow rate from said first and second temperature detecting resistors;

a casing supported to a wall surface of an intake pipe forming said fluid passage and supporting said flow rate measuring element;

a temperature sensor for measuring a temperature in said casing;

a computing unit for receiving the signals corresponding to the fluid flow rate from said first and second temperature detecting resistors, performing correction depending on temperature by using said temperature sensor, and outputting the corrected result; and

flow rate detecting means causing an offset voltage provided as an output voltage of said flow rate detecting circuit at a flow rate of zero to be changed depending on an ambient temperature.

5. The thermal flowmeter of the fluid according to Claim 4, wherein said flow rate detecting means includes a serial circuit of said first temperature measuring resistor and said second temperature measuring resistor, and said first temperature measuring resistor and said second temperature measuring resistor have different resistance temperature coefficients from each other.

6. The thermal flowmeter of the fluid according to Claim

4 or 5, wherein said flow rate detecting means includes a serial circuit of said first temperature measuring resistor and said second temperature measuring resistor both having the same resistance temperature coefficient, and a fixed resistor differing in resistance temperature coefficient from said first and said second temperature measuring resistors is connected to said second temperature measuring resistor in parallel.